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AUTHOR Rodriguez-Aragon, Graciela; And Others
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ABSTRACT

The predictive power of the Split-Half version of the Wechsler Intelligence Scale for Children--Revised (WISC-R) Object Assembly (OA) subtest was compared to that of the full administration of the OA subtest. A cohort of 218 male and 49 female adolescent offenders detained in a Texas juvenile detention facility between 1990 and 1992 was used. The correlation between the scores obtained on the OA subtest in the Split-Half version and the full administration indicates that the brief administration is effective and saves time. The short form may have considerable clinical utility. It is important to remember that these results do not generalize to the other nine WISC-R subtests or to the Verbal, Performance, and Full Scale intelligence quotients. (SLD)

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Equivalence Reliability of the Split-Half WISC-R Object Assembly Subtest in a Cohort of Juvenile Offenders

Graciela Rodriguez-Aragon

Texas A&M University 77843-4225

Anthony A. Scott

University of Texas Health Science Center

at San Antonio 7802-78284

Thelma J. Montelongo

University of Texas Health Science Center

at San Antonio 7802-78284

Paper presented at the annual meeting of the Southwest Educational Research Association, Austin, TX, January 29, 1993.

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ABSTRACT

The present study explored the equivalence reliability of a short form of the object assembly subtest from the WISC-R. Subjects were 267 adolescent offenders. Results were reasonably favorable regarding the utility of the measure.

The need for abbreviated forms to assess individual intellectual functioning appears to be growing. This is especially true of institutional treatment settings where the proportion of examiners to clients continues to decrease and where time limitations prevail. Settings with such circumstances include the public school systems, where children participating in special education programs have to undergo initial intellectual evaluation and a re-evaluation at least every three years, in accordance to the Public Law 94-142. In this particular setting only the range in which the Full Scale IQ (FSIQ) falls is taken into account for placement purposes, and therefore an abbreviated form of an Intellectual evaluation could be effectively applied. Because the delinquency rate in the United States appears to be rapidly increasing (Williams & Gold, 1972), such settings also include juvenile correctional facilities.

The most widely used instrument for intellectual assessment of children and adolescents is the Wechsler Intelligence Scale for Children-Revised (WISC-R). Multiple investigators have developed short forms of the WISC-R where only a few of the subtests in the instrument are administered to the client while maintaining a good correlation with the general intelligence factor (Goh, 1980; Kaufman, 1979). Kennedy and Elder (1982) developed a prediction equation that can be applied to the results of five designated WISC-R subtests: Information, Block Design, Comprehension, Picture Arrangement, and Coding, to predict the range of intellectual functioning with an acceptable accuracy. However, other

investigators have attempted to abbreviate the WISC-R by administering every other item of most subtests and then using a correction factor and multiplying it by a constant (Satz & Mogel, 1962, Yudin, 1966, and Silverstein, 1968). These have been described as "split-half" forms.

Following a similar paradigm, in 1980 Kenneth L. Hobby developed the Split-Half version of the WISC-R (S-H WISC-R) (Hobby, 1980). Hobby used a standardization sample of 1,100 students, aged 6-0 to 16-11, who were referred by parents and/or schools for individual testing. At least 100 subjects composed each age group, and approximately 50 school districts were included in the selection process of subjects. The population consisted of learning disabled, mentally handicapped, emotionally disturbed, slow learners, students with behavioral problems, and normal children being evaluated to determine their optimal learning environment.

The mean scores of the Verbal, Performance, and Full Scale IQ's in the S-H standardization sample were about one standard deviation below the normal population, as defined by the WISC-R standard norms. The mean of the subtest scores were also one to three scaled score points below the mean score of the WISC-R normative data. These results reflect the sample of referred students with whom school psychologists are most commonly involved. Because the intent was not to build new norms, it was not important to obtain a randomly stratified sample.

In the S-H WISC-R, approximately half of nine subtests are

utilized, while the Digit Span, Coding, and Mazes subtests are administered in their entirety. Because Coding and Mazes are speeded tests, they do not lend themselves to split-half analysis.

The administration procedures for the S-H remain the same as the standardized procedures described in the WISC-R Manual (Wechsler, 1974), although the starting points, basales, items administered and ceilings tend to vary depending on the particular subtest. This information is outlined in the WISC-R Split-Half manual (Hobby, 1982). All Performance items are timed, and within the Object Assembly (OA) subtest only the first and the third items are administered.

Because the time taken to complete the S-H is approximately 60% of the administration time of the long form, the role of fatigue and time pressure are significantly reduced. However, because in the WISC-R S-H each item administered contributes more to the total score than the same item would on the long form, errors in scoring are double that which would occur with the long form, and therefore the examiner needs to be especially careful when engaging in this procedure. The correction scores for each subtest and IQ scales are based on the subject's age, and are given in the WISC-R S-H scoring booklet and Manual. Only Information and the subtests which are completely administered do not require a correction score.

Hobby (1980) reported very high correlations between the WISC-R and the WISC-R S-H Form for Full Scale, Performance and Verbal IQ's, making the application of this instrument highly attractive

for many clinicians and researchers.

A recent study by Bawden and Byrne (1991) investigated the validity and clinical utility of the WISC-R S-H Form in four groups of children referred for neuropsychological assessment when compared to the WISC-R long form. It was found that the long and short-form estimates of intellectual ability and subtest scale scores were highly, positively correlated for all groups. However, it was also found that the WISC-R S-H Form tended to overestimate Verbal, Performance, and Full Scale IQ's for all groups referred because of suspected or proven brain dysfunction. This caused an upward shift in the intellectual classification category for these groups. The WISC-R S-H Form patterns of strength-weakness profiles were also significantly different to those yielded by the long form for the neuropsychological groups, indicating that the WISC-R S-H does not lend itself to this type of analysis with this population.

The authors concluded that the WISC-R S-H Form is useful for the estimation of IQ scores, although extreme caution must be taken when using it with neuropsychological populations due to its tendency to overestimate. It is also important to acknowledge that in the study the obtained correlations were artificially inflated, because the variability in scores was reduced by the rescoring of the original long form protocols, a procedure which is typical in this type of studies, including the present study.

The present study analyzed the predictive power of the Split-Half version of the WISC-R Object Assembly (OA) subtest when compared to the full administration of the Object Assembly, in a

cohort of juvenile offenders. Correlational analyses were performed for these purposes.

Methodology

Subjects

Subjects in this study were 267 male and female (218 males and 49 females) adolescent offenders detained at the Bexar County Juvenile Detention Center (BCJDC) between 1990 and 1992. The subjects were participants in a prevention and educational program provided by the University of Texas Health Science Center at San Antonio (UTHSCSA). The majority of subjects came from a low socioeconomic status, were Hispanic males, and their ages ranged from 11 years, 5 months to 16 years, 11 months, with an approximate average age of 15 years.

Procedure and Analyses

As part of the UTHSCSA prevention program the participants underwent psychological/cognitive assessment at the BCJDC. The subjects were administered a battery of instruments which included a clinical interview, the Trails Making Tests (A and B), the Wide Range Achievement Test-Revised (WRAT-R), the Benton Visual Retention Test, the Wisconsin Card Sorting Test, the Grooved Pegboard Test, the Personal Experience Screen Questionnaire, the Brief Symptom Inventory (BSI), and the WISC-R S-H.

Within the WISC-R S-H Short Form the Object Assembly subtest was fully administered, rather than only administering the first and third items, the usual procedure for this instrument. The time and scores for both the Split-Half Short Form and the long form

versions were calculated and a record of these scores was kept. In addition to exploring relationships between OA scores obtained in the short form versus the long form by obtaining a Pearson product-moment correlation coefficient, a comparison of the total time taken to administer both versions was also performed.

Results

The Pearson correlation coefficient involving the scores obtained on the OA subtest by the WISC-R S-H Short Form method and the long form method was +.7755 ($p < .01$). This indicates that the WISC-R S-H Short Form version of the OA subtest is highly correlated to the long form of the OA, and that the use of the S-H Short Form yield scores that are reasonably reliable for estimating the long form score of the OA subtest.

The mean time taken for the long form equaled 170.644 seconds ($SD = 68.50$), while the mean time for the S-H form was 61.682 seconds ($SD = 26.05$). This difference was statistically significant, and it indicates that there was a considerable time saving with the use of the S-H Short Form.

Discussion

With the increase in juvenile delinquency in this country and the need for abbreviated forms of standardized intellectual assessment in various settings, the use of the S-H WISC-R is likely to be on the rise. In the past, researchers have found that delinquent populations score higher in the Performance part of the WISC-R than the Verbal portion (Culberton, 1989; Grace & Sweeney, 1986). This is also characteristic of Hispanics, Native Americans,

and learning disabled (Kaufman, 1990). Culberton and his colleagues (1989) analyzed the patterns obtained by delinquent boys in the WISC-R and found that juvenile offenders tend to score high on the Object Assembly, Picture completion, and Picture Arrangement subtests. These findings are consistent with the literature and indicate that in these populations the Performance IQ is a more accurate estimator of the individual's overall daily functioning than the Verbal or Full Scale IQ scores.

When developing a testing battery to use with these populations, these findings have to be taken into account. The instruments used need to be culturally sensitive in order to obtain a more accurate measure of the individual's intellectual functioning. It is also of primary importance to consider that the use of abbreviated procedures of any instrument will involve the loss of some type of clinical information, validity, and reliability even when the abbreviated version involves the reduction in the number of items for each subtest and not the number of subtests (Dean, 1977). Therefore, is the clinician who has to decide whether the advantage of saving time outweighs the disadvantage of losing what could be precious diagnostic information. It is likely that the best implementation for short form procedures is at the re-evaluation stage rather than at the initial clinical diagnosis, so that there will be other information available for comparison. Abridged procedures may also be useful as screening devises, although they do not lend themselves to an analysis of scatter patterns (Bawden & Byrne, 1991).

In the present study the correlation between the scores obtained on the OA subtest, as given by the S-H WISC-R administration and the full administration of the WISC-R, seems to indicate that the brief administration is effective and saves time. Thus, this short-form may have considerable clinical utility.

However, the present study investigated the reliability of only one subtest (OA), and it is important to consider that these results do not generalize to the other nine WISC-R subtests nor the Verbal IQ, Performance IQ or Full Scale IQ. Because of the homogenous sample used in this study, it is also important to remember that these results do not generalize to the population at large. As discussed previously, it is also important to consider that because of the methodology used in this study, it is likely that the correlation coefficient was somewhat artificially inflated, since there was no statistical correction invoked in the correlation computations (Bawden & Byrne, 1991). Therefore, further studies using the Silvertein's (1968) correction formula and more heterogenous samples need to be performed before further conclusions can be reached.

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